GUIDELINES FOR USE OF DISPERSANTS ON SPILLED OIL—A MODEL PLAN

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ABSTRACT: *The American Petroleum Institute Spill Response and Effects Task Force has developed guidelines (a "model plan") for use of dispersants on spilled oil. This model plan is consistent with subpart H of the National Contingency Plan and provides the information needed to implement subpart H. The model plan addresses the questions of where, when, why, and how dispersants should be used and what materials should be used. The components of the model plan are the following:*

- *Detailed descriptions of most of the currently used methods for making dispersant use decisions*
- *A dispersant use information form (Federal Region VI format)*
- *Discussion of the technical basis for dispersant use decision making*
- *Tabulations of properties (specific gravity, viscosity, pour point, and sulfur content) of oils transported through or produced in the area of interest, including an indication of relative dispersibility of each of these products*
- *Inventories of dispersants and application equipment*
- *A quality assurance/quality control plan*
- *Literature on dispersant application techniques.*

The purpose of developing this model plan is to provide a format that may be used to establish consistent regional and local dispersant use plans throughout the country.

Dispersant use is sometimes an appropriate means of oil spill mitigation. However, dispersant use in some cases may be rejected because there is insufficient information available to the federal On-Scene Coordinator (OSC) to make a decision. As a means of overcoming this information gap and providing a basis for making timely and appropriate dispersant use decisions, the Spill Response and Effects Task Force of the American Petroleum Institute (API) has prepared a Model Plan for Dispersant Use, based on subpart H of the National Contingency Plan and knowledge of dispersant use technology.

One reason for preparing this model plan is that we feel that it would be useful both to the regulatory community and to industry if contingency plans for dispersant use were consistent throughout the United States.

Subpart H of the National Contingency Plan provides that the federal OSC may approve use of chemical dispersants on oil spills with concurrence of the U.S. Environmental Protection Agency and the affected states.[4] Subpart H also provides that the OSC may approve use of dispersants without further concurrence if he acts in accordance with a plan that has been agreed upon by the regional response team (RRT) in advance of a spill.

The purpose of preparing a regional subpart H is to expedite decision making at the time of an oil spill emergency by answering in advance most questions relating to dispersant use. Decisions regarding dispersant use need to be prompt, because oils become progressively more difficult to disperse as they weather. Well-considered, timely decisions about dispersants will reduce the likelihood of unnecessary environmental damage.

The model plan prepared by API is suggested as the basis for subpart H of regional contingency plans. Copies of the model plan are available from API at the request of RRTs.

Some questions cannot be answered until the time of the spill:

- What oil has been spilled?
- Where?
- How much?
- What are weather and sea conditions?
- What resources will be affected?

However, many questions regarding dispersant use should be answered well in advance of a spill and would be impractical to answer in a timely manner at the time of a spill:

- What sensitive resources might be affected by a spill?
- Where are they likely to be found at each time of the year?
- What are the local priorities for protecting these resources?
- How will decisions be made whether to use dispersants at the time of a spill?
- What kinds of oils might be spilled?
- What are the properties of these oils?
- Is there any plan or protocol for evaluating the effectiveness of dispersant use after application?
- Can the areas of greatest spill risk be defined (ports, heavily traveled sea lanes, oil production platforms, etc.)?
- What types of dispersant supplies are available?
- What are their properties?
- What equipment is available to apply the dispersants?
- Has it been calibrated properly?
- Have users been trained in dispersant application?
- Have observers been trained to monitor and direct dispersant application?

The model plan developed by API meets most of the needs for subpart H of a regional contingency plan. One section (Appendix A of the plan) describes the major dispersant use decision-making systems that have been published to date. Another (Appendix B) is a form for recording the spill-specific information that can only be obtained at the time of a spill and would be needed for a dispersant use decision. Other sections cover typical equipment and dispersant inventories, a system for quality assurance/quality control (calibration, observation, and monitoring), properties of oils that may be spilled and the effects of weathering, and information on dispersant application techniques. The contents of the seven appendixes in the API model plan are discussed below.

Dispersant use decisions. The use of an oil spill dispersant is appropriate if the environmental damage caused by the dispersed oil

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would be less than the damage caused by undispersed oil. In planning, maps should be prepared showing the important resources (e.g., wildlife populations, sensitive habitats, and economically important recreational facilities) in each area that might be damaged by an oil spill. These maps will be a part of the plan.

Several published methods to make decisions regarding dispersant use are described in Appendix A of the model plan. These decision-making methods are described in more detail in another paper at this conference.[2]

Dispersant use information form. A significant amount of information regarding the spill should be available before requesting permission to use dispersants. This information should include the type of oil spilled, the quantity spilled, the location of the spill, weather conditions, and the resources that are at risk (which requires a prediction of spill trajectory). The information needed is included in Appendix B of the API model plan. The decision maker will also need to know the relative environmental effects resulting from treated and untreated oil, but it is not appropriate to include this in the dispersant use information form. Information on the environmental effects of dispersed and untreated oil may take considerable time to acquire and should be gathered in advance of any spill emergency. (The information form shown in the API model plan was developed by the regional response team of Federal Region VI.[1])

Technical basis for dispersant use decisions. In addition to the mechanics of making a dispersant use recommendation, the user should understand the technical basis on which such a recommendation is based. Appendix C of the model plan discusses such factors, including the following.

- Is any countermeasure needed and why?
- Is the use of a chemical dispersant appropriate environmentally?
- Is the oil dispersible?
- Are available dispersants appropriate for dispersing the oil spilled?
- Are weather conditions appropriate for chemical dispersion of the spilled oil?
- Is appropriate equipment available to apply the dispersant properly?
- Is the oil thickness appropriate for use of chemical dispersants?
- Can other countermeasures be used and are they available to use?
- Will the cost of spill mitigation be less if dispersants are used?

Oil properties. Appendix D lists oils transported through or produced in the area of interest, together with a brief tabulation of their properties that may be relevant to a dispersant use decision, properties such as viscosity, pour point, API gravity, and sulfur content. For the model plan, for example, oils found in the U.S. Gulf of Mexico are shown. Data on oil properties are available from companies that transport or produce oils in the particular area of interest.

Dispersants and application equipment. Appendix E lists resources of dispersants that are available in the area of interest, dispersant properties (manufacturers' literature), and available dispersant spray equipment. For the model plan, typical generic information on dispersants is shown. The information for any given area will of course be specific for that area.

Quality assurance/quality control plan. Appendix F describes a quality assurance/quality control program to ensure that the correct amount of dispersant is applied to the spilled oil in a timely fashion. This program specifies the steps to take at various stages to help secure this result.

Before the spill. The equipment should be selected, calibrated, and tested, and personnel should be trained.

At the time of the spill. An action plan should be developed, earlier equipment selection and calibration reviewed, craft to spray dispersant and observational aircraft selected, and appropriate communications equipment acquired.

After dispersant application. Effects of the dispersant application should be monitored. As discussed in a technical paper of the International Tanker Owners Pollution Federation, one of the most appropriate means of evaluating the effectiveness of a dispersant is visual inspection by a trained observer.[3]

Dispersant application techniques. Copies of several publications are included in Appendix G, giving concise but clear guidance on the selection, calibration, and use of dispersant application equipment and on the use of dispersants, with emphasis on aerial application.

References

1. Dispersant Working Group, 1988. Authorization for the Use of Dispersants in Non-Life Threatening Situations. Subpart H, Regional Contingency Plan, EPA, Federal Region VI
2. Fraser, J. P., 1989. Methods used for dispersant use decision making. *Proceedings of the 1989 Oil Spill Conference,* American Petroleum Institute, Washington, D.C.
3. International Tanker Owners Pollution Federation, Ltd., 1982. Aerial Application of Oil Spill Dispersants. Technical Information Paper No. 3. ITOPF, London. 8pp
4. U.S. Environmental Protection Agency, 1984. National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule. 40 CFR Part 300. *Federal Register,* v49, n139, Wednesday, July 18, pp29,192–29,207